Space Weather Forecast

Issued on Thursday, 01 September 2022 at 13:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of M-flares (R1-R2 Blackouts). Minor Geomagnetic Storm likely day 3 (3 Sep).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Low, with no significant solar flares. There are two numbered sunspot regions on the visible disc. The most prominent is positioned in the southwest of the disc, but despite magnetic complexity has been relatively inactive. A small region in the centre of the northern hemisphere is small and unipolar. A third unnumbered region is now emerging over the southeast limb. No new Earth bound CMEs have recently been observed on available imagery.

Solar Wind / Geomagnetic Activity: Solar winds are elevated and have roughly been in the range 500 to 600 km/s due to faster solar wind related to a coronal hole. Total magnetic field strength was at weak to moderate levels and the important northwards/southwards component varied weakly, with spells of southwards orientation observed. Geomagnetic activity was Quiet to Unsettled (Kp1-3) with an Active interval in the final three hour period of 31 Aug.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background levels, with no solar radiation storms occurring

Four-Day Space Weather Forecast Summary

Solar Activity: Activity is Low. There is a chance of an isolated Moderate flare from the large region in the southwest and this region also offers a slight chance of a Strong flare.

Solar Wind / Geomagnetic Activity: An eruption observed on 30 August produced a Coronal Mass Ejection (CME) which may give a glancing blow across Earth, and this is most likely to occur later on day 3 (3 September). Solar winds are predicted to decline during the next couple of days. A fast solar wind is due to connect later on 02 September with a second is likely to affect the Earth from either late on 03 September or during 04 September.
Geomagnetic activity is likely to continue Quiet to Unsettled on day 1, with a chance of an isolated Active interval. Further Unsettled to Active intervals are then probable for days 3 and 4, with a likely G1/Minor Storm interval, due mainly to the effects of the coronal hole high speed streams along with the potential CME arrival during day 3.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is likely to remain below the Minor Radiation Storm level (S1). There remains a slight chance of further increases to or above the S1 level, should any significant flares occur from the large region on the visible disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	10	30	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	20	20
Very Active	R3 to R5 X	No	5	5	5	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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